

**Programme for International  
Student Assessment  
(PISA) 2000**

**The Performance of Canadian Youth  
in Reading, Mathematics and Science**

**Results for Québec Students Aged 15**

**Québec** 

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Student Assessment  
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**Ministère de l'Éducation**

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**Ensuring the Future of Canadian Youth**  
**Programme for International Student Assessment (PISA) 2000**  
**Results for Québec Students Aged 15**

**The assessment**

The Programme for International Student Assessment (PISA) is a project initiated by the Organisation for Economic Co-operation and Development (OECD). PISA's aim is to assess the degree to which students approaching the end of their compulsory education have acquired some of the knowledge and competencies that are essential for full participation in society. This assessment, which was carried out through a standardized international test, measures the achievement of 15-year-old students in three major domains: reading literacy, mathematical literacy and scientific literacy. The 2000 assessment was devoted mainly to reading. Those of 2003 and 2006 will focus on mathematical literacy and scientific literacy, respectively.

Thirty-two countries participated in PISA 2000. Statistics Canada put together a representative sample of Canadian schools and classes. Québec made sure that it had a large enough sample so that its results would appear separately from those of Canada as a whole. The assessment took place in April and May 2000 in 165 Québec schools, and 4500 15-year-old students were tested.

This document presents the results for Québec 15-year-olds and compares them with the results for students from the rest of Canada and the world. The data are taken from the Canadian report entitled *Measuring up: The performance of Canada's youth in reading, mathematics and science—OECD PISA Study—First Results for Canadians aged 15*, which can be downloaded free of charge from any of the following Web sites:

[www.pisa.gc.ca](http://www.pisa.gc.ca)

[www.statcan.ca](http://www.statcan.ca)

[www.cmec.ca](http://www.cmec.ca)

[www.hrdc-drhc.gc.ca/arb](http://www.hrdc-drhc.gc.ca/arb)

## Part 1: Student results in reading

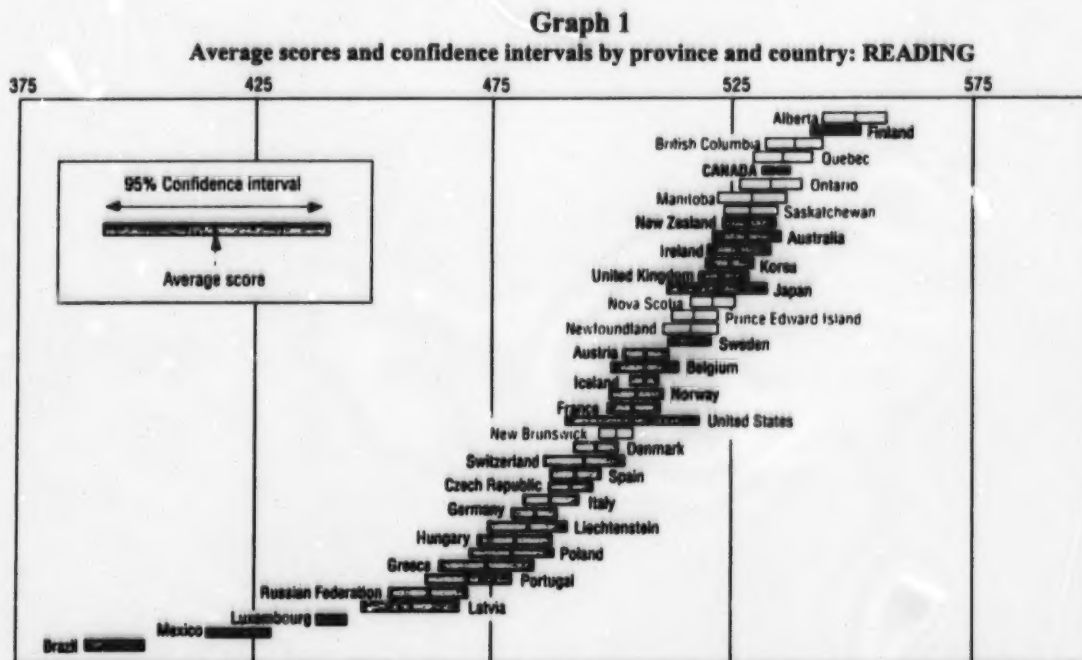
### 1.1 Context

On the reading tests, students were required to perform a series of tasks using a variety of texts, i.e. retrieve specific information, demonstrate their overall understanding of the text, and interpret and reflect on its content or form. PISA assessed the students' reading performance with respect to the form and structure of the reading material, the type of reading task and the use for which the text was constructed.

### 1.2 Results for Québec students in reading

Québec 15-year-olds ranked fourth among the 32 countries and 10 Canadian provinces participating in the assessment. Only Alberta students achieved results that were statistically higher than those of Québec students.

The average scores and confidence intervals by province and country for overall reading scores are illustrated in Graph 1 below and in Table 1 in Appendix 1.



**Note:** The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps. For example, jurisdictions performing about the same as Canada have a confidence interval for the average score that overlaps with Canada's confidence interval.

**Source:** Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

### 1.3 Results by scale

#### 1.3.1 Retrieving written information

The "retrieving information" scale reports on students' ability to locate information in a text. Québec students ranked sixth on this scale. Only students from Finland and Alberta performed significantly better than Québec students.

**Table 2**

| Average scores and confidence intervals for selected provinces and countries |         |                |                      |
|------------------------------------------------------------------------------|---------|----------------|----------------------|
| RETRIEVING WRITTEN INFORMATION                                               |         |                |                      |
|                                                                              | Average | Standard error | Confidence interval* |
| Finland                                                                      | 556     | (2.8)          | 5.5                  |
| Alberta                                                                      | 549     | (3.5)          | 7.0                  |
| Australia                                                                    | 536     | (3.7)          | 7.4                  |
| British Columbia                                                             | 535     | (3.1)          | 6.1                  |
| New Zealand                                                                  | 535     | (2.8)          | 5.6                  |
| QUÉBEC                                                                       | 531     | (3.2)          | 6.4                  |
| Anglophone Québec                                                            | 538     | (3.5)          | 7.0                  |
| Francophone Québec                                                           | 530     | (4.8)          | 9.6                  |
| CANADA                                                                       | 530     | (1.7)          | 3.3                  |
| France                                                                       | 515     | (3.0)          | 5.9                  |
| United States                                                                | 499     | (7.4)          | 14.6                 |

\* The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

#### 1.3.2 Interpreting written information

The "interpreting" scale reports on the students' ability to construct meaning and draw inferences from written information. Québec students ranked third on this scale. Only students from Finland performed significantly better than Québec students.

**Table 3**

| Average scores and confidence intervals for selected provinces and countries |         |                |                     |
|------------------------------------------------------------------------------|---------|----------------|---------------------|
| INTERPRETING WRITTEN INFORMATION                                             |         |                |                     |
|                                                                              | Average | Standard error | Confidence interval |
| Finland                                                                      | 555     | (2.9)          | 5.7                 |
| Alberta                                                                      | 546     | (3.3)          | 6.6                 |
| QUÉBEC                                                                       | 538     | (3.0)          | 6.0                 |
| Anglophone Québec                                                            | 539     | (4.5)          | 9.0                 |
| Francophone Québec                                                           | 538     | (3.4)          | 6.8                 |
| British Columbia                                                             | 534     | (2.8)          | 5.6                 |
| CANADA                                                                       | 532     | (1.6)          | 3.1                 |
| France                                                                       | 506     | (2.7)          | 5.4                 |
| United States                                                                | 505     | (7.1)          | 14.1                |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

### 1.3.3 Reflecting on written information

The "reflecting" scale reports on students' ability to relate texts to their knowledge, ideas and experiences. Only students from Alberta performed significantly better than Québec students. On this scale, there was a slight significant difference (1 point) between Anglophone and Francophone students in Québec, with the Anglophones performing better.

**Table 4**

| Average scores and confidence intervals for selected provinces and countries |            |                |                     |
|------------------------------------------------------------------------------|------------|----------------|---------------------|
| REFLECTING ON WRITTEN INFORMATION                                            |            |                |                     |
|                                                                              | Average    | Standard error | Confidence interval |
| Alberta                                                                      | 559        | (3.5)          | 6.9                 |
| British Columbia                                                             | 547        | (2.8)          | 5.6                 |
| Ontario                                                                      | 544        | (3.2)          | 6.4                 |
| <b>CANADA</b>                                                                | <b>542</b> | <b>(1.6)</b>   | <b>3.1</b>          |
| Saskatchewan                                                                 | 539        | (2.6)          | 5.1                 |
| United Kingdom                                                               | 539        | (2.5)          | 5.0                 |
| Manitoba                                                                     | 539        | (3.3)          | 6.6                 |
| <b>QUÉBEC</b>                                                                | <b>537</b> | <b>(3.1)</b>   | <b>6.1</b>          |
| Anglophone Québec                                                            | 552        | (4.6)          | 9.2                 |
| Francophone Québec                                                           | 535        | (3.4)          | 6.8                 |
| Finland                                                                      | 533        | (2.7)          | 5.4                 |
| United States                                                                | 507        | (7.1)          | 14.1                |
| France                                                                       | 496        | (2.9)          | 5.7                 |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

### 1.4 Five levels of reading proficiency

Rankings can tell us how countries and provinces compare with each other overall. They tell us nothing, however, about what students can actually do. We can elicit more information from the data if we are able to describe what can be done at specific score levels. For this reason, reading achievement was divided into five levels (1 to 5). Essentially, these levels represent the most difficult test items that a student could answer. It could therefore be assumed that a student at one level would be able to answer questions at all lower levels. Only at Level 5 did the percentage of Alberta students (22.5) surpass the percentage of Québec students (15.9).

**Table 5**

| Reading scales                       |                  |                  |                   |                   |                   |                   |
|--------------------------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| Percentage of students at each level |                  |                  |                   |                   |                   |                   |
|                                      | Below Level 1    | Level 1          | Level 2           | Level 3           | Level 4           | Level 5           |
| Alberta                              | 1.8 (0.5)        | 6.1 (0.7)        | 14.7 (0.8)        | 26.7 (1.2)        | 28.2 (1.0)        | 22.5 (1.4)        |
| Finland                              | 1.7 (0.5)        | 5.3 (0.4)        | 14.2 (0.7)        | 28.7 (0.8)        | 31.6 (0.9)        | 18.5 (0.9)        |
| Australia                            | 3.3 (0.5)        | 9.2 (0.7)        | 18.9 (1.1)        | 25.2 (0.8)        | 25.8 (1.0)        | 17.6 (1.2)        |
| British Columbia                     | 2.4 (0.5)        | 7.0 (0.7)        | 17.5 (0.9)        | 26.3 (1.1)        | 28.7 (1.0)        | 18.1 (1.1)        |
| <b>QUÉBEC</b>                        | <b>2.0 (0.4)</b> | <b>6.4 (0.6)</b> | <b>17.2 (0.9)</b> | <b>29.4 (1.1)</b> | <b>29.2 (1.1)</b> | <b>15.9 (1.0)</b> |
| United Kingdom                       | 3.6 (0.4)        | 9.3 (0.5)        | 19.6 (0.7)        | 27.5 (0.9)        | 24.4 (0.9)        | 15.6 (0.9)        |
| Manitoba                             | 2.0 (0.4)        | 8.6 (0.9)        | 18.7 (1.2)        | 29.6 (1.5)        | 25.2 (1.2)        | 15.9 (1.2)        |
| <b>CANADA</b>                        | <b>2.4 (0.3)</b> | <b>7.3 (0.3)</b> | <b>17.9 (0.4)</b> | <b>28.0 (0.5)</b> | <b>27.7 (0.6)</b> | <b>16.8 (0.5)</b> |
| Belgium                              | 7.7 (1.0)        | 11.4 (0.8)       | 16.7 (0.7)        | 25.7 (0.8)        | 26.5 (0.8)        | 12.0 (0.7)        |
| France                               | 4.2 (0.6)        | 11.1 (0.8)       | 21.9 (0.8)        | 30.6 (1.0)        | 23.7 (0.9)        | 8.5 (0.5)         |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

## 1.5 Results by gender

Table 6 shows that girls performed significantly better than boys on the reading test in Québec, as they did in all countries and in all provinces. In all cases, the differences between girls and boys are statistically significant.

**Table 6**

| Average scores in reading by gender, country and province |            |                |                     |            |                |                     |
|-----------------------------------------------------------|------------|----------------|---------------------|------------|----------------|---------------------|
|                                                           | Girls      |                |                     | Boys       |                |                     |
|                                                           | Average    | Standard error | Confidence interval | Average    | Standard error | Confidence interval |
| <b>Canada</b>                                             | <b>551</b> | <b>1.7</b>     | <b>3.4</b>          | <b>519</b> | <b>1.8</b>     | <b>3.5</b>          |
| France                                                    | 519        | 2.7            | 5.4                 | 490        | 3.5            | 7.0                 |
| United States                                             | 518        | 6.2            | 12.3                | 490        | 8.4            | 16.7                |
| Japan                                                     | 537        | 5.4            | 10.7                | 507        | 6.7            | 13.4                |
| Belgium                                                   | 525        | 4.9            | 9.8                 | 492        | 4.2            | 8.4                 |
| Finland                                                   | 571        | 2.8            | 5.5                 | 520        | 3.0            | 6.0                 |
| Sweden                                                    | 536        | 2.5            | 4.9                 | 499        | 2.6            | 5.1                 |
| Switzerland                                               | 510        | 4.5            | 9.0                 | 480        | 4.9            | 9.7                 |
| Newfoundland                                              | 538        | 3.1            | 6.1                 | 496        | 3.7            | 7.4                 |
| Prince Edward Island                                      | 535        | 3.5            | 7.0                 | 500        | 3.0            | 6.0                 |
| Nova Scotia                                               | 538        | 3.1            | 6.1                 | 505        | 3.4            | 6.7                 |
| New Brunswick                                             | 525        | 2.0            | 4.1                 | 478        | 2.7            | 5.5                 |
| <b>QUÉBEC</b>                                             | <b>553</b> | <b>3.3</b>     | <b>6.5</b>          | <b>521</b> | <b>3.4</b>     | <b>6.8</b>          |
| Ontario                                                   | 548        | 3.5            | 6.9                 | 518        | 3.9            | 7.8                 |
| Manitoba                                                  | 548        | 4.2            | 8.4                 | 513        | 3.7            | 7.4                 |
| Saskatchewan                                              | 548        | 3.3            | 6.6                 | 512        | 3.2            | 6.4                 |
| Alberta                                                   | 571        | 3.5            | 7.1                 | 533        | 4.0            | 7.9                 |
| British Columbia                                          | 555        | 3.3            | 6.6                 | 523        | 4.0            | 7.9                 |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

## 1.6 Results by language of the education system

The difference between the results for Anglophone and Francophone students in Québec was not statistically significant. Of the provinces with linguistic minorities, only the Anglophone minority in Québec performed as well as the linguistic majority in the same province.

**Table 7**

| Average scores in reading by province and language of the education system |            |                |                     |            |                |                     |
|----------------------------------------------------------------------------|------------|----------------|---------------------|------------|----------------|---------------------|
|                                                                            | English    |                |                     | French     |                |                     |
|                                                                            | Average    | Standard error | Confidence interval | Average    | Standard error | Confidence interval |
| Nova Scotia                                                                | 522        | 2.3            | 4.7                 | 474        | 5.2            | 10.4                |
| New Brunswick                                                              | 512        | 2.3            | 4.6                 | 478        | 2.6            | 5.1                 |
| <b>QUÉBEC</b>                                                              | <b>543</b> | <b>4.6</b>     | <b>9.1</b>          | <b>535</b> | <b>3.3</b>     | <b>6.6</b>          |
| Ontario                                                                    | 535        | 3.4            | 6.7                 | 474        | 7.4            | 14.7                |
| Manitoba                                                                   | 530        | 3.6            | 7.1                 | 486        | 5.5            | 10.9                |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

## 1.7 The impact of various characteristics on reading achievement

The PISA assessment makes it possible to analyze how various characteristics influence reading achievement. Generally speaking, the characteristics below had positive effects on the reading achievement of Canadian and Québec students.

**Reading enjoyment** had a positive effect on reading achievement in all countries, with a higher level of reading enjoyment associated with a higher level of achievement. Within Canada, a moderate positive effect of reading enjoyment on reading achievement was evident in all provinces, with Québec ranking last among the provinces.

A higher level of **reading diversity** is associated with a higher level of achievement. The positive effects were small in almost all countries and provinces, including Québec.

Students who spend more **time reading for enjoyment** achieved higher scores. Students reading two or more hours daily, however, did not perform as well. This phenomenon was observed in every Canadian province except Nova Scotia. It was particularly evident in Québec.

The **number of books in the home** also played a role in the students' performance. In Québec, the relationship between achievement and access to a large number of books in the home appears to be minimal.

In general, students who **use public and school libraries** are better readers. There was little difference between students who use public and school libraries several times a month and those who use them only once a month. In Canada, including Québec, this pattern is less pronounced than in the other countries.

Students who **spend a lot of time on homework** achieved better results than those who spend less time on homework. The positive effect on achievement, however, was small. In Canada, the positive effect was moderate in Alberta and small in Québec.

**Higher student career expectations** are associated with higher achievement. The positive effect was small in half the countries and moderate in the other half. Canada ranked approximately halfway up the scale. The positive effect in Canada as a whole appears to be uniformly small, while in Québec it was moderate.

Achievement varies according to **student education expectations**. The longer the students expect to stay in school, the more motivated they are to study. This was the case in Québec.

**Having a job during the summer or during the school year** had a negative effect on the performance of students in every province. In Québec, students without jobs scored significantly higher than those who had jobs. As the hours worked per week increased, performance tended to decline. Small negative effects were found in all provinces.

In all provinces except Newfoundland, students from **two-parent families** did better in school than those from **single-parent families**. The effect of **family structure** was small in Québec. The difference in achievement between students from two-parent families and students from single-parent families was greater on the mathematics test than on the reading or science test.

A larger number of siblings in the family had a negative relationship with student achievement. The effect was small, however, in almost all countries. In Canada and Québec, the number of siblings had a negative or trivial effect, or no effect at all, on academic achievement. The effects of the number of siblings in the family on the students' results were trivial.

**Socioeconomic status (SES)** was the most important factor affecting student achievement in reading, mathematics and science. In virtually all countries, students with higher family socioeconomic statuses performed better in reading, mathematics and science. Of all the provinces, Québec always has the highest scores in mathematics across all levels of family socioeconomic status. The standardized effect size, however, suggests that the overall effect of socioeconomic status is small or moderate in all countries. In addition, socioeconomic status had less impact in Canada than in most of the other countries.

A higher level of **family possessions** was associated with a greater degree of academic achievement, although its effect was small. In Canada and Québec, this factor was less important than in the other countries.

A higher level of **home educational resources** was associated with better academic achievement. In general, the effects of home educational resources were small, especially in Canada.

**Home cultural possessions** had moderate positive effects on academic achievement in half the countries. In Canada, it had a small positive effect. Home cultural possessions had more impact on reading achievement than on mathematics achievement.

**Cultural activities** had a positive effect on academic achievement in all countries. In Québec, they had a small positive effect. Effects of cultural activities tended to be larger for reading achievement than for mathematics achievement, although they were small in both cases.

**Family educational support** was negatively associated with academic achievement in almost all countries. In fact, a high level of educational support corresponded to poor academic achievement. This indicates that students with lower academic achievement tend to receive more help from family members than do students with higher achievement. Small negative effects of family educational support were found in almost all countries. The effects in Canada were among the smallest.

A high level of **parental academic interest** was associated with high academic achievement. The effects of parental academic interest, however, were small, nowhere more so than in Québec.

**Parent social interest** had small positive effects on reading achievement. The effects, however, were small, nowhere more so than in Québec.

Across all domains and in all provinces, a universal pattern emerged which linked a higher level of **parental expectations** with greater student achievement. Students whose parents expected them to get a university education had significantly higher average performance than did those whose parents expected them to complete a college or vocational education diploma or a secondary school diploma. Only in Québec were the differences significant in all three domains.

In Canada, close to 94% of 15-year-olds were enrolled in **public schools**; this figure was 84% in Québec. In general, in almost all countries and provinces, students attending public schools did

not perform as well as students attending **private schools**. The effect size of the performance disadvantage of public school students was moderate at the Canada level (-0.46). It was greater in Québec (-0.51).

The differences noted above, however, do not warrant conclusions about the relative effectiveness of private schools and public schools. Home circumstances also play an important role in shaping the schooling outcomes of children. Private schools are more accessible to children of higher-income families, and the socioeconomic background of the student population has a significant impact on reading test scores.

The **average family socioeconomic status** or **average family possessions of the students in a school** had an impact on the achievement of all students, regardless of their personal socioeconomic status. Students from schools where the average family SES was lower tended not to perform as well as students from schools where the average family SES was higher. In Canada and Québec, the overall effect size of school SES on the performance of students was small. The same was generally true for students from schools where the average index of family possessions was lower.

Within Canada, students from Québec were least likely to report **disruptions** caused by students in **language arts classrooms**. The figure for Québec (0.08), however, suggests that, on average, there are more disruptions in Québec schools than in schools in most of the participating countries. Students in schools where there are few disturbances in language arts classrooms tend to achieve better reading results. The effect size of this variable was small for most countries.

Compared with principals in all the other jurisdictions that took part in PISA, principals in Canada reported that the **negative behaviour of teachers** was less of a problem in their schools. Principals evaluated whether student learning was hindered by teachers' low expectations of student performance, poor teacher-student relations, teachers not meeting individual student needs, teacher absenteeism, staff resisting change, teachers being too strict with students, and students not being encouraged to achieve their full potential. Again, there were significant differences among provinces. While school principals in Ontario and Newfoundland reported that negative behaviour of teachers had little effect on the learning of 15-year-olds in their schools, their colleagues in New Brunswick and Québec reported more problematic impacts.

Students in Canada overwhelmingly reported a supportive and caring environment in their schools, especially with respect to **interactions with teachers**. Such results suggest that, in the eyes of students, teachers in Canada generally do a good job of meeting their needs. In Canada and to a lesser extent in the other countries, schools where **students reported less positive relations with their teachers** tended to have lower reading scores. In most Canadian provinces, including Québec, the effect size of this relation was trivial.

Students attending schools in which **teacher shortage** was less of a problem generally had higher reading scores. It must be noted that the effect size was relatively small (very small in Québec). The numbers show, however, that schools in which **teacher morale and commitment** were low generally achieved lower results in reading. The effect size was relatively small in Canada (very small in Québec), but larger on an international scale.

## Part 2: Student results in mathematics

### 2.1 Context

The PISA 2000 assessment, in which mathematics is a minor domain, assessed mathematical literacy in three dimensions:

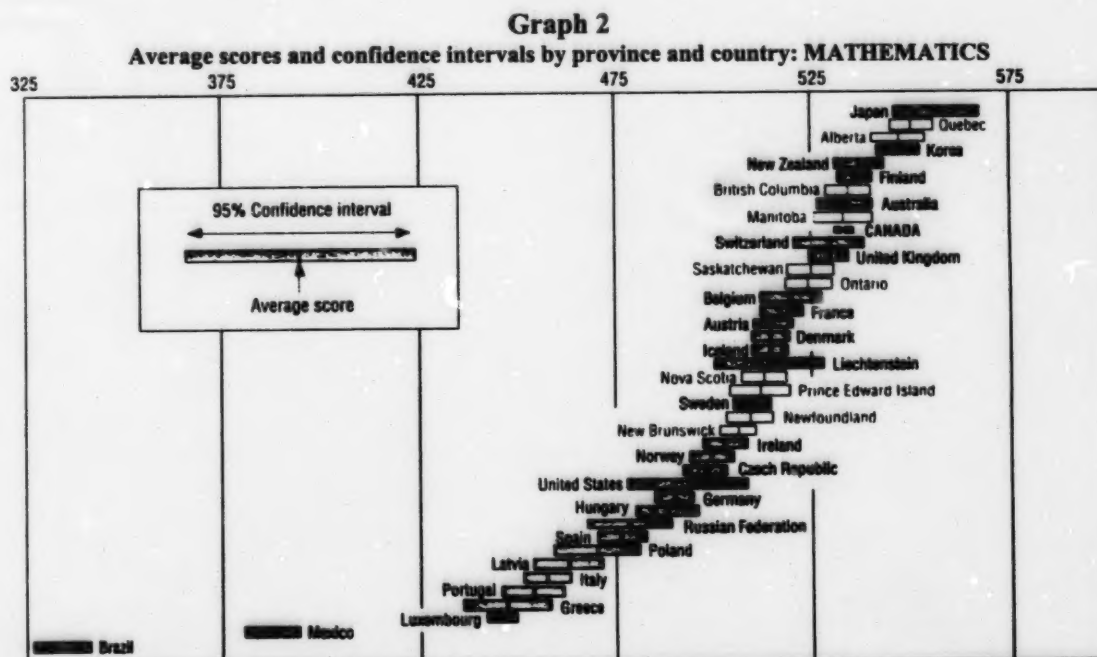
- the content of mathematics, as defined mainly in terms of broad mathematical concepts underlying mathematical thinking
- the process of mathematics, as defined by general mathematical competencies, such as the use of mathematical language, modelling and problem-solving skills
- the situations in which mathematics is used, ranging from private contexts to those relating to wider scientific and public issues

For the purposes of PISA, mathematical literacy is the ability to put mathematical knowledge and skills to functional use rather than just mastering them within a school curriculum

### 2.2 Results for Québec students in mathematics

Among the 32 participating provinces and countries, Québec ranked near the top in mathematics. Japanese students did not perform significantly better than Québec students. These results confirm those achieved in the 1999 Third International Mathematics and Science Study [TIMSS-99] (Korea scored higher than Québec) and the 1997 School Achievement Indicators Program (SAIP) in mathematics.

The average scores and confidence intervals by province and country for overall mathematics scores are illustrated in Graph 2 below and in Table 8 in Appendix 2.



Note: The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

## 2.3 Results by gender

In Québec, boys scored higher than girls in mathematical literacy, but the difference was not significant. This trend can be observed in almost all countries, which was not the case on the TIMSS-99.

**Table 9**

| <b>Average scores in mathematical literacy by gender, country and province</b> |                |                       |                            |                |                       |                            |
|--------------------------------------------------------------------------------|----------------|-----------------------|----------------------------|----------------|-----------------------|----------------------------|
|                                                                                | <b>Girls</b>   |                       |                            | <b>Boys</b>    |                       |                            |
|                                                                                | <b>Average</b> | <b>Standard error</b> | <b>Confidence interval</b> | <b>Average</b> | <b>Standard error</b> | <b>Confidence interval</b> |
| Japan                                                                          | 553            | (5.9)                 | 11.8                       | 561            | (7.3)                 | 14.5                       |
| <b>QUÉBEC</b>                                                                  | <b>547</b>     | <b>(3.2)</b>          | <b>6.3</b>                 | <b>556</b>     | <b>(3.4)</b>          | <b>6.7</b>                 |
| Alberta                                                                        | 543            | (3.7)                 | 7.4                        | 553            | (4.6)                 | 9.1                        |
| Finland                                                                        | 536            | (2.6)                 | 5.2                        | 537            | (2.8)                 | 5.6                        |
| Manitoba                                                                       | 532            | (5.1)                 | 10.1                       | 535            | (3.9)                 | 7.8                        |
| <b>Canada</b>                                                                  | <b>529</b>     | <b>(1.6)</b>          | <b>3.2</b>                 | <b>539</b>     | <b>(1.8)</b>          | <b>3.5</b>                 |
| British Columbia                                                               | 528            | (4.1)                 | 8.1                        | 541            | (3.5)                 | 7.0                        |
| Australia                                                                      | 527            | (5.1)                 | 10.2                       | 539            | (4.1)                 | 8.2                        |
| United Kingdom                                                                 | 526            | (3.7)                 | 7.3                        | 534            | (3.5)                 | 6.9                        |
| Switzerland                                                                    | 523            | (4.8)                 | 9.6                        | 537            | (5.3)                 | 10.6                       |
| Ontario                                                                        | 520            | (3.2)                 | 6.4                        | 529            | (3.9)                 | 7.8                        |
| Saskatchewan                                                                   | 519            | (4.0)                 | 8.0                        | 531            | (3.4)                 | 6.8                        |
| Belgium                                                                        | 518            | (5.2)                 | 10.3                       | 524            | (4.6)                 | 9.2                        |
| France                                                                         | 511            | (2.8)                 | 5.6                        | 525            | (4.1)                 | 8.1                        |
| New Brunswick                                                                  | 508            | (2.5)                 | 5.0                        | 506            | (3.5)                 | 7.0                        |
| Prince Edward Island                                                           | 508            | (5.0)                 | 9.9                        | 518            | (4.5)                 | 9.0                        |
| Newfoundland                                                                   | 507            | (3.6)                 | 7.1                        | 513            | (4.5)                 | 8.9                        |
| Nova Scotia                                                                    | 507            | (3.8)                 | 7.5                        | 520            | (4.3)                 | 8.6                        |
| Sweden                                                                         | 507            | (3.0)                 | 6.0                        | 514            | (3.2)                 | 6.5                        |
| United States                                                                  | 490            | (7.3)                 | 14.6                       | 497            | (8.9)                 | 17.6                       |
| Germany                                                                        | 483            | (4.0)                 | 8.0                        | 498            | (3.1)                 | 6.2                        |
| Russian Federation                                                             | 479            | (6.2)                 | 12.4                       | 478            | (5.7)                 | 11.3                       |
| Italy                                                                          | 454            | (3.8)                 | 7.5                        | 462            | (5.3)                 | 10.6                       |
| Mexico                                                                         | 382            | (3.8)                 | 7.6                        | 393            | (4.5)                 | 8.9                        |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

## Part 3: Student results in science

### 3.1 Context

Part of the PISA 2000 assessment focused on scientific literacy and assessed three dimensions:

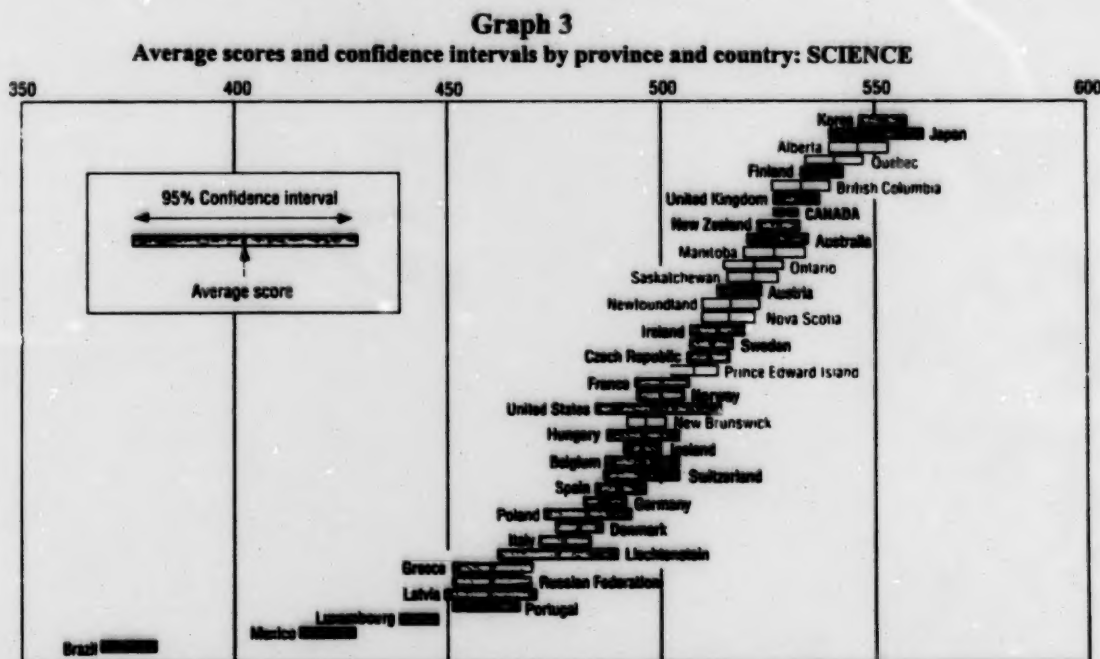
- scientific concepts, which are needed to understand certain phenomena of the natural world and the changes made to it through human activity. The main content of the assessment was selected from within three broad areas of application: science of life and health, science of the earth and the environment, and science in technology
- scientific processes, which are centred on the ability to acquire, interpret and act upon evidence
- scientific situations, selected mainly from people's everyday lives rather than from the practice of science in a school classroom or laboratory, or the work of professional scientists

Scientific literacy is defined as the capacity to use scientific knowledge, to identify questions, and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and changes made to it through human activity.

### 3.2 Results for Québec students in science

Among the 32 participating countries and provinces, Québec ranked near the top in science. Students from Korea, Japan and Alberta did not perform significantly better than Québec students. These results confirm those achieved on the TIMSS-99 (Alberta scored higher than Korea and Japan).

The average scores and confidence intervals by province and country for overall science scores are illustrated in Graph 3 below and in Table 10 in Appendix 3.



Note: The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

### 3.3 Results by gender

Table 11 shows that the results for girls in Québec, like those for girls from most participating countries and provinces, were not significantly different from the results for boys on the scientific literacy test. No significant difference was observed on the TIMSS-99.

**Table 11**

| Average scores in scientific literacy by gender, country and province |         |                |                     |         |                |                     |
|-----------------------------------------------------------------------|---------|----------------|---------------------|---------|----------------|---------------------|
|                                                                       | Girls   |                |                     | Boys    |                |                     |
|                                                                       | Average | Standard error | Confidence interval | Average | Standard error | Confidence interval |
| Japan                                                                 | 554     | (5.9)          | 11.7                | 547     | (7.2)          | 14.3                |
| Alberta                                                               | 549     | (3.8)          | 7.6                 | 545     | (4.5)          | 8.9                 |
| QUÉBEC                                                                | 542     | (4.1)          | 8.2                 | 541     | (3.8)          | 7.6                 |
| Finland                                                               | 541     | (2.7)          | 5.4                 | 534     | (3.5)          | 7.0                 |
| British Columbia                                                      | 533     | (3.9)          | 7.8                 | 535     | (4.3)          | 8.5                 |
| United Kingdom                                                        | 531     | (4.0)          | 7.9                 | 535     | (3.4)          | 6.8                 |
| Canada                                                                | 531     | (1.7)          | 3.5                 | 529     | (1.9)          | 3.8                 |
| Australia                                                             | 529     | (4.8)          | 9.5                 | 526     | (3.9)          | 7.8                 |
| Manitoba                                                              | 526     | (4.4)          | 8.8                 | 530     | (4.4)          | 8.7                 |
| Ontario                                                               | 525     | (3.6)          | 7.2                 | 520     | (4.5)          | 8.9                 |
| Newfoundland                                                          | 522     | (4.6)          | 9.1                 | 511     | (4.7)          | 9.3                 |
| Saskatchewan                                                          | 521     | (4.1)          | 8.1                 | 523     | (3.5)          | 7.1                 |
| Nova Scotia                                                           | 518     | (4.2)          | 8.4                 | 515     | (4.5)          | 9.0                 |
| Sweden                                                                | 513     | (2.9)          | 5.7                 | 512     | (3.5)          | 6.9                 |
| Prince Edward Island                                                  | 511     | (3.7)          | 7.3                 | 506     | (4.2)          | 8.3                 |
| New Brunswick                                                         | 505     | (3.1)          | 6.1                 | 490     | (3.2)          | 6.4                 |
| United States                                                         | 502     | (6.5)          | 12.9                | 497     | (8.9)          | 17.8                |
| France                                                                | 498     | (3.8)          | 7.5                 | 504     | (4.2)          | 8.4                 |
| Belgium                                                               | 498     | (5.6)          | 11.2                | 496     | (5.2)          | 10.4                |
| Switzerland                                                           | 493     | (4.7)          | 9.3                 | 500     | (5.7)          | 11.3                |
| Germany                                                               | 487     | (3.4)          | 6.8                 | 489     | (3.4)          | 6.7                 |
| Italy                                                                 | 483     | (3.9)          | 7.8                 | 474     | (5.6)          | 11.2                |
| Russian Federation                                                    | 467     | (5.2)          | 10.3                | 453     | (5.4)          | 10.7                |
| Mexico                                                                | 419     | (3.9)          | 7.7                 | 423     | (4.2)          | 8.4                 |

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

## **Conclusion**

According to the PISA report, 15-year-old students in Québec had excellent scores in reading, mathematics and science. These results are not surprising and confirm those achieved in the assessment of 13- and 16-year-old students conducted by the Council of Ministers of Education, Canada (CMEC) within the School Achievement Indicators Program (SAIP) and in the Third International Mathematics and Science Study (TIMSS-99) conducted among 9- and 13-year-old students by the International Association for the Evaluation of Educational Achievement.

Québec students posted better results than the Canadian average in all three domains of literacy, but the differences in reading were not statistically significant.

On the reading test, only the results for Alberta students were significantly higher than those for students from both language groups in Québec. The performance of the two language groups in Québec was about the same. Since reading is essential for learning and mastering all other school subjects, these excellent results are very encouraging. Although the reading results on the SAIP and in the PISA assessment cannot be compared because of their widely divergent methodologies, it can be said that both studies highlight the excellence of reading instruction in the Québec education system. There is no doubt that a detailed analysis of these results will confirm that the recent changes made to the curriculum with respect to reading instruction will help narrow the performance gap between Québec and more successful education systems.

Although Québec's 15-year-old students achieved excellent results in mathematics and science, the 2003 and 2006 PISA assessments will provide more detailed information about students' proficiency in these domains.

Canada's performance was outstanding. The data collected suggest that the best way of improving results in all the provinces is to improve the performance of young people from families with lower socioeconomic statuses.

The performance of all young Quebecers in the PISA assessment is definitely very promising for their future, and for the future of Québec.

Table 1

| Average scores and confidence intervals by province and selected countries |         |                |                      |
|----------------------------------------------------------------------------|---------|----------------|----------------------|
| READING LITERACY (OVERALL SCORES)                                          |         |                |                      |
| Countries and provinces                                                    | Average | Standard error | Confidence interval* |
| Alberta                                                                    | 550     | (3.3)          | 6.5                  |
| Finland                                                                    | 546     | (2.6)          | 5.1                  |
| British Columbia                                                           | 538     | (2.9)          | 5.7                  |
| QUÉBEC                                                                     | 536     | (3.0)          | 6.0                  |
| Anglophone Québec                                                          | 543     | (4.6)          | 9.1                  |
| Francophone Québec                                                         | 535     | (3.3)          | 6.6                  |
| CANADA                                                                     | 534     | (1.6)          | 3.1                  |
| Ontario                                                                    | 533     | (3.3)          | 6.5                  |
| Manitoba                                                                   | 529     | (3.5)          | 7.0                  |
| Saskatchewan                                                               | 529     | (2.7)          | 5.3                  |
| New Zealand                                                                | 529     | (2.8)          | 5.5                  |
| Australia                                                                  | 528     | (3.5)          | 7.0                  |
| Ireland                                                                    | 527     | (3.2)          | 6.4                  |
| Korea                                                                      | 525     | (2.4)          | 4.8                  |
| United Kingdom                                                             | 523     | (2.6)          | 5.1                  |
| Japan                                                                      | 522     | (5.2)          | 10.4                 |
| Nova Scotia                                                                | 521     | (2.3)          | 4.5                  |
| Prince Edward Island                                                       | 517     | (2.4)          | 4.8                  |
| Newfoundland                                                               | 517     | (2.8)          | 5.6                  |
| Sweden                                                                     | 516     | (2.2)          | 4.4                  |
| Austria                                                                    | 507     | (2.4)          | 4.8                  |
| Belgium                                                                    | 507     | (3.6)          | 7.1                  |
| Iceland                                                                    | 507     | (1.5)          | 2.9                  |
| Norway                                                                     | 505     | (2.8)          | 5.6                  |
| France                                                                     | 505     | (2.7)          | 5.4                  |
| United States                                                              | 504     | (7.0)          | 14.0                 |
| New Brunswick                                                              | 501     | (1.8)          | 3.5                  |
| Denmark                                                                    | 497     | (2.4)          | 4.7                  |
| Switzerland                                                                | 494     | (4.2)          | 8.4                  |
| Spain                                                                      | 493     | (2.7)          | 5.4                  |
| Czech Republic                                                             | 492     | (2.4)          | 4.7                  |
| Italy                                                                      | 487     | (2.9)          | 5.8                  |
| Germany                                                                    | 484     | (2.5)          | 4.9                  |
| Liechtenstein                                                              | 483     | (4.1)          | 8.2                  |
| Hungary                                                                    | 480     | (4.0)          | 7.9                  |
| Poland                                                                     | 479     | (4.5)          | 8.9                  |
| Greece                                                                     | 474     | (5.0)          | 9.9                  |
| Portugal                                                                   | 470     | (4.5)          | 9.0                  |
| Russian Federation                                                         | 462     | (4.2)          | 8.3                  |
| Latvia                                                                     | 458     | (5.3)          | 10.3                 |
| Luxembourg                                                                 | 441     | (1.6)          | 3.2                  |
| Mexico                                                                     | 422     | (3.3)          | 6.6                  |
| Brazil                                                                     | 396     | (3.1)          | 6.2                  |

Note: The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

Table 8

Average scores and confidence intervals  
by province and selected countries

| MATHEMATICAL LITERACY   |         |                |                      |
|-------------------------|---------|----------------|----------------------|
| Countries and provinces | Average | Standard error | Confidence interval* |
| Japan                   | 557     | (5.5)          | 10.9                 |
| QUÉBEC                  | 550     | (2.7)          | 5.5                  |
| Alberta                 | 547     | (3.3)          | 6.6                  |
| Korea                   | 547     | (2.8)          | 5.5                  |
| New Zealand             | 537     | (3.1)          | 6.3                  |
| Finland                 | 536     | (2.1)          | 4.3                  |
| British Columbia        | 534     | (2.8)          | 5.6                  |
| Australia               | 533     | (3.5)          | 6.9                  |
| Manitoba                | 533     | (3.7)          | 7.3                  |
| CANADA                  | 533     | (1.4)          | 2.8                  |
| Switzerland             | 529     | (4.4)          | 8.7                  |
| United Kingdom          | 529     | (2.5)          | 5.0                  |
| Saskatchewan            | 525     | (2.9)          | 5.8                  |
| Ontario                 | 524     | (2.9)          | 5.8                  |
| Belgium                 | 520     | (3.9)          | 7.8                  |
| France                  | 517     | (2.7)          | 5.4                  |
| Austria                 | 515     | (2.5)          | 5.0                  |
| Denmark                 | 514     | (2.4)          | 4.9                  |
| Iceland                 | 514     | (2.3)          | 4.5                  |
| Liechtenstein           | 514     | (7.0)          | 13.9                 |
| Nova Scotia             | 513     | (2.8)          | 5.6                  |
| Prince Edward Island    | 512     | (3.7)          | 7.4                  |
| Sweden                  | 510     | (2.5)          | 4.9                  |
| Newfoundland            | 509     | (3.0)          | 5.9                  |
| New Brunswick           | 506     | (2.2)          | 4.4                  |
| Ireland                 | 503     | (2.7)          | 5.4                  |
| Norway                  | 499     | (2.8)          | 5.5                  |
| Czech Republic          | 498     | (2.8)          | 5.5                  |
| United States           | 493     | (7.6)          | 15.2                 |
| Germany                 | 490     | (2.5)          | 5.0                  |
| Hungary                 | 488     | (4.0)          | 8.0                  |
| Russian Federation      | 478     | (5.5)          | 10.9                 |
| Spain                   | 476     | (3.1)          | 6.2                  |
| Poland                  | 470     | (5.5)          | 10.9                 |
| Latvia                  | 463     | (4.5)          | 8.7                  |
| Italy                   | 457     | (2.9)          | 5.8                  |
| Portugal                | 454     | (4.1)          | 8.1                  |
| Greece                  | 447     | (5.6)          | 11.1                 |
| Luxembourg              | 446     | (2.0)          | 4.0                  |
| Mexico                  | 387     | (3.4)          | 6.7                  |
| Brazil                  | 333     | (3.7)          | 7.4                  |

Note: The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.

Table 10

Average scores and confidence intervals  
by province and selected countries

| SCIENTIFIC LITERACY     |         |                |                      |
|-------------------------|---------|----------------|----------------------|
| Countries and provinces | Average | Standard error | Confidence interval* |
| Korea                   | 552     | (2.7)          | 5.4                  |
| Japan                   | 550     | (5.5)          | 10.9                 |
| Alberta                 | 546     | (3.5)          | 6.9                  |
| QUÉBEC                  | 541     | (3.4)          | 6.7                  |
| Finland                 | 538     | (2.5)          | 4.9                  |
| British Columbia        | 533     | (3.2)          | 6.4                  |
| United Kingdom          | 532     | (2.7)          | 5.3                  |
| CANADA                  | 529     | (1.6)          | 3.1                  |
| New Zealand             | 528     | (2.4)          | 4.8                  |
| Australia               | 528     | (3.5)          | 6.9                  |
| Manitoba                | 527     | (3.6)          | 7.1                  |
| Ontario                 | 522     | (3.4)          | 6.8                  |
| Saskatchewan            | 522     | (3.0)          | 5.9                  |
| Austria                 | 519     | (2.5)          | 5.1                  |
| Newfoundland            | 516     | (3.4)          | 6.7                  |
| Nova Scotia             | 516     | (3.0)          | 6.0                  |
| Ireland                 | 513     | (3.2)          | 6.3                  |
| Sweden                  | 512     | (2.5)          | 5.0                  |
| Czech Republic          | 511     | (2.4)          | 4.8                  |
| Prince Edward Island    | 508     | (2.7)          | 5.4                  |
| France                  | 500     | (3.2)          | 6.3                  |
| Norway                  | 500     | (2.7)          | 5.5                  |
| United States           | 499     | (7.3)          | 14.6                 |
| New Brunswick           | 497     | (2.3)          | 4.5                  |
| Hungary                 | 496     | (4.2)          | 8.3                  |
| Iceland                 | 496     | (2.2)          | 4.3                  |
| Belgium                 | 496     | (4.3)          | 8.5                  |
| Switzerland             | 496     | (4.4)          | 8.8                  |
| Spain                   | 491     | (3.0)          | 5.9                  |
| Germany                 | 487     | (2.4)          | 4.8                  |
| Poland                  | 483     | (5.1)          | 10.2                 |
| Denmark                 | 481     | (2.8)          | 5.6                  |
| Italy                   | 478     | (3.1)          | 6.1                  |
| Liechtenstein           | 476     | (7.1)          | 14.1                 |
| Greece                  | 461     | (4.9)          | 9.7                  |
| Russian Federation      | 460     | (4.7)          | 9.4                  |
| Latvia                  | 460     | (5.6)          | 11.0                 |
| Portugal                | 459     | (4.0)          | 8.0                  |
| Luxembourg              | 443     | (2.3)          | 4.6                  |
| Mexico                  | 422     | (3.2)          | 6.3                  |
| Brazil                  | 375     | (3.3)          | 6.5                  |

Note: The confidence interval represents the range within which the score for the population is likely to fall 95% of the time (or 19 times out of 20). Differences in average scores between two jurisdictions are not statistically significant when the confidence interval for each average score overlaps.

Source: Organisation for Economic Co-operation and Development, Programme for International Student Assessment, 2000.